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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/738,344	12/17/2003	Arianna T. Morales	GP-302303	9697

7590 11/21/2007  
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EXAMINER
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ZIMMERMAN, JOHN J

ART UNIT	PAPER NUMBER
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1794

MAIL DATE	DELIVERY MODE
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11/21/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/738,344	Applicant(s) MORALES ET AL.	
	Examiner John J. Zimmerman	Art Unit 1794	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 September 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 11-14, 16 and 17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 11-14 and 16-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12/17/03 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## SIXTH OFFICE ACTION

### *Amendments*

1. This Sixth Office Action is in response to the remarks and amendments submitted in applicant's communication titled "AMENDMENT" received September 4, 2007. Claims 11-14 and 16-17 are pending in this application.

### *Claim Rejections - 35 USC § 112, First Paragraph*

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 11-14 and 16-17 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention.

4. It is not clear where the originally filed disclosure contains support for the subject matter now claimed. The only reference to a "flat" sheet that has been readily found in the original

disclosure has been found in paragraph [0019] where it is described that the "method is equally applicable to flat sheets". At best, this description would appear to describe the possible alternative manufacture of flat composite structures (not the currently claimed manufacture of curved composite structures). No further description of the use of "flat" sheets, the sequence of forming "flat" sheets, the use of superplastic "flat" sheets, the use of second "flat" sheets or the shape of the tool cavity associated with the use of "flat" sheets has been readily found in the original disclosure.

***Claim Rejections - 35 USC § 112, Second Paragraph***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 11-14 and 16-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. The references to "flat first sheet metal layer" (e.g. claim 11, at lines 17 and 19) and "second flat aluminum metal sheets" (e.g. claim 17, at line 21) are indefinite since no "flat" sheet would be present *after* the superplastic forming steps in the method claims. The precursor structure would be *curved* by time it reached the foaming step of the method sequence.

*Claim Rejections - 35 USC § 103*

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 11-14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seeliger (U.S. Patent 6,090,232) in view of Rashid (U.S. Patent 6,253,588).

10. Seeliger discloses a metal foam composite having a curvilinear shape (e.g. see column 3, lines 13-17; Figure 2). The foam metal can be made from a metal powder such as alloyed aluminum and light metal alloys (a term used in the metallurgical art to refer to alloys such as aluminum alloys) can be used for the solid metal sheets (e.g. see column 2, lines 14-20). The foam layer can be made by mixing the metal powder with a blowing agent (e.g. see column 2, lines 42-48) to form a foamable semi-finished product. The layers are assembled as shown in Figure 2. The composite is molded into a formed semifinished product (e.g. column 3, lines 13-18) by a one sided molding procedure (e.g. column 3, lines 29-31) and the semifinished product is placed in the cavity of a foaming mold for in situ foaming and final forming (e.g. see column 3, lines 42-49). Foam alloys of the types described would be expected to have metallic microphases (e.g. applicant's claim 8). Seeliger discloses that the blowing agent is a metal hydride in the prior art (e.g. see column 1, lines 16-23). Seeliger discloses that his metal foam composite can be used for car body panels in providing crash protection (e.g. see column 4, lines

31-44). Seelinger may differ from the claims in that Seelinger may not disclose the use of superplastic or quick plastic deforming to shape the semifinished product before the foaming step. Rashid, however, discloses that car body panels made with sheet metal can be made more easily using superplastically formable metal materials (e.g. see column 1, first paragraph) and quick plastic forming processes (e.g. see column 1, lines 5-12). Processing steps, forming steps and conditions are disclosed by Rashid (e.g. see claims 1-14). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use superplastically formable metal materials for the car body panels of Seeliger because Rashid discloses that superplastically formable materials have processing advantages over in car body panel manufacture if complex shapes are needed. In view of the advantages disclosed by Rashid, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use superplastic or quick plastic deforming to shape the semifinished product of Seelinger because the semifinished products could be made in complex shapes that would be suitable for automobile parts. As disclosed by Seelinger, the semifinished product would then be placed in a mold cavity to perform the foaming step that would result in a cohesive foamed composite structure.

11. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Seeliger (U.S. Patent 6,090,232) in view of Baumeister (U.S. Patent 5,151,246) and further in view of Rashid (U.S. Patent 6,253,588).

12. Seeliger discloses a metal foam composite having a curvilinear shape (e.g. see column 3, lines 13-17; Figure 2). The foam metal can be made from a metal powder such as alloyed

aluminum and light metal alloys (a term used in the metallurgical art to refer to alloys such as aluminum alloys) can be used for the solid metal sheets (e.g. see column 2, lines 14-20). The foam layer can be made by mixing the metal powder with a blowing agent (e.g. see column 2, lines 42-48) to form a foamable semi-finished product. The layers are assembled as shown in Figure 2. The composite is molded into a formed semifinished product (e.g. column 3, lines 13-18) by a one sided molding procedure (e.g. column 3, lines 29-31) and the semifinished product is placed in the cavity of a foaming mold for in situ foaming and final forming (e.g. see column 3, lines 42-49). Foam alloys of the types described would be expected to have metallic microphases (e.g. applicant's claim 8). Seeliger discloses that the blowing agent is a metal hydride in the prior art (e.g. see column 1, lines 16-23), but does not disclose that the blowing agent is specifically titanium hydride as required by applicant's claim 17. Baumeister, however, discloses that titanium hydride blowing agent is a conventional metal hydride blowing agent that is used with aluminum alloy powders in the prior art (e.g. see Examples 1-7) and Baumeister also discloses typical foaming temperatures for various metal powder and blowing agent mixtures. In view of Baumeister, the use of a mixture of aluminum alloy powder with a titanium hydride blowing agent would have been obvious to one of ordinary skill in the art at the time the invention was made for the metal foam composite of Seeliger because Baumeister shows titanium hydride to be a common metal hydride blowing agent in the prior art and Baumeister also supplies further details on making metal foam compositions and their processing temperatures that Seeliger omits. Seeliger discloses that his metal foam composite can be used for car body panels in providing crash protection (e.g. see column 4, lines 31-44). Seeliger may differ from the claims in that Seeliger may not disclose the use of superplastic or quick plastic

deforming to shape the semifinished product before the foaming step. Rashid, however, discloses that car body panels made with sheet metal can be made more easily using superplastically formable metal materials (e.g. see column 1, first paragraph) and quick plastic forming processes (e.g. see column 1, lines 5-12). Processing steps, forming steps and conditions are disclosed by Rashid (e.g. see claims 1-14). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use superplastically formable metal materials for the car body panels of Seeliger because Rashid discloses that superplastically formable materials have processing advantages over in car body panel manufacture if complex shapes are needed. In view of the advantages disclosed by Rashid, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use superplastic or quick plastic deforming to shape the semifinished product of Seeliger because the semifinished products could be made in complex shapes that would be suitable for automobile parts. As disclosed by Seeliger, the semifinished product would then be placed in a mold cavity to perform the foaming step that would result in a cohesive foamed composite structure.

### ***Response to Arguments***

13. Applicant's arguments filed September 4, 2007 have been fully considered but they are not persuasive.

14. Regarding the rejection of the claims under 35 U.S.C. 103(a) as being unpatentable over Seeliger (U.S. Patent 6,090,232) in view of Rashid (U.S. Patent 6,253,588), applicant points out that the claims as amended provide a flat sheet metal layer having a foaming precursor thereon,



which is subsequently shaped and foamed in the curved forming tool cavity. Applicant argues that Seeliger discloses that the piece to be molded needs to be "semi-finished" and "must already have its final contour, since a further contouring by the foaming of the semi-finished molded product 7 into a component 1 no longer brings about any molding of this side 10." As such, applicant submits that Seeliger teaches away from applicant's claimed invention as amended. In response to these arguments, the examiner notes that applicant uses essentially the same sequence of operations as those used by Seeliger. Seeliger forms a semi-finished (prefoamed) product into a contoured shape (column 3, lines 13-36) and then places the contoured shape into a contoured foaming mold column 3, lines 37-56) and foams the product into a shape that is limited by the upper contoured wall of the foaming mold (e.g. column 3, line 57 - column 4, line 18). In the same manner, applicant forms a prefoamed precursor structure into a curved precursor shape (claim 1, lines 9-15) and then foams the curved precursor shape in a curved tool cavity so that the foamed product is made into a curved shape that is defined by the curved cavity of the forming tool (e.g. claim 1, lines 21-22). Applicant's precursor structure is a *curved* precursor structure when it is introduced into the foaming step, just as Seeliger's semi-finished molded product is a contoured product when it is introduced into the foaming step.

### *Conclusion*

15. **THIS ACTION IS MADE FINAL.** Applicant's amendment necessitated the new grounds of rejection under 35 U.S.C. 112, first and second paragraphs, presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory

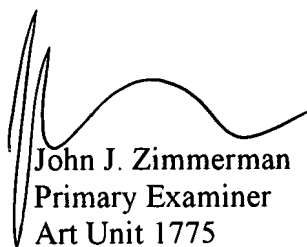
period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John J. Zimmerman whose telephone number is (571) 272-1547. The examiner can normally be reached on 8:30am-5:00pm, M-F. Supervisor Rena Dye can be reached on (571) 272-1498. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

17. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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John J. Zimmerman  
Primary Examiner  
Art Unit 1775

jjz  
November 16, 2007